



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/574,565

04/04/2006

Tomokazu Hayashi

77661-65

2114

23838 7590 03/04/2009

KENYON & KENYON LLP  
1500 K STREET N.W.  
SUITE 700  
WASHINGTON, DC 20005

EXAMINER

PARSONS, THOMAS H

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/04/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/574,565	<b>Applicant(s)</b> HAYASHI ET AL.	
	<b>Examiner</b> THOMAS H. PARSONS	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 14-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 14-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 February 2009 has been entered.

***(Previous) DETAILED ACTION***

***Specification***

1. The objection to the disclosure because of minor informalities has been withdrawn in view of Applicants' Amendment.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 14-23 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuchi et al. (US 6,833,210) in view of Inoue et al. (US 20020055027).

**Claim 14:** Kikuchi et al. disclose seal structure of a fuel cell (Figure 1), the fuel cell including an MEA (3), a separator (4A or 5A, in Figures 2 and 3), a gas passage (4a or 5a, in

Art Unit: 1795

Figures 2 and 3) formed in separator, a gas manifold (17 or 18, in Figures 2 and 3) formed in the separator, a connecting gas passage (23A or 25A, in Figures 2 and 3) formed in the separator and between the gas passage and the gas manifold, a coolant passage (4a or 5a, in Figure 4) formed in the separator, a coolant manifold (19, in Figure 4) formed in the separator, a connecting coolant passage (26, in Figure 4) formed in the separator and between the coolant passage and the coolant manifold, and a seal (6A, 7A, and 27, in Figures 2-4) for preventing gas and/or coolant from leaking and defining a continuous seal line, the seal structure of a fuel cell comprising an interrupted back-up (support members 29A-D, in Figures 2-4) disposed at at least one of the connecting gas passage and the connecting coolant passage, the back-up located on one side of the separator and a portion of seal line (6A, 7A or 27, in Figures 2-4; see also col. 1: 39-54 which discloses peripheral seals) located on the other side of the separator being disposed such that said back-up and the portion of the seal line are overlapped with each other in a fuel cell stacking direction (e.g., Figure 12 shows a fuel cell stack comprising unit cells 2A wherein a seal line formed by gas seal members 6A and 7A on a {left} side of separator 5A and a backup (support member 29B) on the other {right} side of the separator. In a stacking direction, the gas seal members of the seal line and the backup are overlapped), characterized in that the back-up (29A) in Figure 11 is formed in the separator (4A)(i.e. integrated) and includes a rib having a convex and concave structure (col. 9: 54-67 and col. 14: 3-6), wherein the back-up is integrally formed in the separator (col. 14: 1-6). See also entire document, in particular, col. 6: 12-col. 11: 24.

Kikuchi et al. do not disclose that the separator is made from metal.

Art Unit: 1795

Inoue et al. in paragraphs [0017]-[0020] disclose a fuel cell comprising a separator made from a metal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the carbon separator with the metal separator of Inoue et al. because Inoue et al. teach a metal separator that would have provided flexibility, thereby inhibiting breakage.

**Claim 15:** Kikuchi et al. in Figures 2-3 disclose that the back-up (29A-B) is disposed at connecting gas passage (23A, 25A) between the gas passage (4a, 5a) and the gas manifold (17, 18, 20, 21). See also Figures 12-14.

**Claim 16:** Kikuchi et al. in Figure 4 disclose that the back-up (29C-D) is disposed at said connecting coolant passage (26) between said coolant passage (4a, 5a) and said coolant manifold (19, 22). See also Figures 12-14.

**Claim 17:** Kikuchi et al. in Figures 2-4 disclose that the gas manifold (17, 18, 20, 21) and the coolant manifold (19, 22) differs in width to each other, the interrupted back-up (29A-D) and a portion of the seal line (6A, 7A or 27) positioned in an extension of the interrupted back-up are disposed on a same straight line. See also Figures 12-14.

**Claim 18:** Kikuchi et al. in Figures 2-4 disclose that the back-up (29A in Figure 11) is formed in the separator (integrated) and includes a plurality of protrusions spaced from each other. See also Figures 12-14.

**Claim 19:** Kikuchi et al. in Figures 2-4 disclose that the back-up is formed in the separator (i.e. integrated) and includes a rib having a plurality of tunnels formed in the rib and spaced from each other (e.g. Figure 11).

**Claim 20:** Kikuchi et al. in Figures 2-4 disclose that an entire portion of the back-up located between adjacent separators is formed (i.e. integrated) in either one separator of the adjacent separators. See also Figures 12-14.

**Claim 21:** Kikuchi et al. in Figures 2-4 disclose that a portion of the back-up located between adjacent separators is formed in one separator of the adjacent separators (i.e. integrated) , and a remaining portion of the back-up located between adjacent separators is formed in the other separator of the adjacent separators (see col. 14: 1-2 which discloses that the back-up {i.e. support members 29A-D} may be integrated with the respective separator.

**Claim 22:** Kikuchi et al. in Figure 1 a back-up (support member 29A) is formed in the separator (4A) and includes a rib having a plurality of tunnels (8) formed in rib, between the separator (4A) and a cover plate (5A), and spaced from each other.

**Claim 23:** Kikuchi et al. disclose seal structure of a fuel cell (Figure 1), the fuel cell including an MEA (3), a separator (4A or 5A, in Figures 2 and 3), a gas passage (4a or 5a, in Figures 2 and 3) formed in separator, a gas manifold (17 or 18, in Figures 2 and 3) formed in the separator, a connecting gas passage (23A or 25A, in Figures 2 and 3) formed in the separator and between the gas passage and the gas manifold, a coolant passage (4a or 5a, in Figure 4) formed in the separator, a coolant manifold (19, in Figure 4) formed in the separator, a connecting coolant passage (26, in Figure 4) formed in the separator and between the coolant passage and the coolant manifold, and a seal (6A, 7A, and 27, in Figures 2-4) for preventing gas and/or coolant from leaking and defining a continuous seal line, the seal structure of a fuel cell comprising an interrupted back-up (support members 29A-D, in Figures 2-4) disposed at an at least one of the connecting gas passage and the connecting coolant passage, the back-up located

Art Unit: 1795

on one side of the separator and a portion of seal line (6A, 7A or 27, in Figures 2-4; see also col. 1: 39-54 which discloses peripheral seals) located on the other side of the separator being disposed such that the back-up and the portion of the seal line are overlapped with each other in a fuel cell stacking direction (e.g., Figure 12 shows a fuel cell stack comprising unit cells 2A wherein a seal line formed by gas seal members 6A and 7A on a {left} side of separator 5A and a backup (support member 29B) on the other {right} side of the separator. In a stacking direction, the gas seal members of the seal line and the backup are overlapped), characterized in that the back-up (29A) in Figure 11 is formed in the separator (4A)(i.e. integrated) and includes a rib having a convex and concave structure (col. 9: 54-67 and col. 14: 3-6), wherein the back-up is integrally formed in the separator (col. 14: 1-6), wherein the back-up is formed in at least one of the connecting gas passage and the connecting coolant passage at a portion of the separator where the seal does not exits (e.g. see Figure 4 showing a back-up 29C-D) formed in the connecting coolant passage (26) at a portion of the separator where seal (27) does not exist). See also entire document, in particular, col. 6: 12-col. 11: 24.

Kikuchi et al. do not disclose that the separator is made from metal.

Inoue et al. in paragraphs [0017]-[0020] disclose a fuel cell comprising a separator made from a metal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the carbon separator with the metal separator of Inoue et al. because Inoue et al. teach a metal separator that would have provided flexibility, thereby inhibiting breakage.

**Claim 24:** The rejection of claim 24 is as set forth above in claim 22.

***Response to Arguments***

4. Applicant's arguments filed 12 February 2009 have been fully considered but they are not persuasive.

5. I. The Applicants', on page 8, lines 3-15, state that the record is not clear as to which portion(s) of Kikuchi the Office Action is relying upon (if any) as equating to each and every limitation of the Applicant's claims. For example, the Applicant's specification shows front and rear views of the separator plate. In contrast, it is respectfully submitted that that Kikuchi only shows one side, thus, it is not clear how it describes the limitations "...wherein said back-up being located on one side of said separator and a portion of the seal line located on the other side of said separator ....".

In response, Kikuchi et al. in Figures 1-4 discloses a seal structure, the seal structure of a fuel cell comprising an interrupted back-up (support members 29A-D, in Figures 2-4) disposed at at least one of the connecting gas passage and the connecting coolant passage, the back-up located on one side of the separator and a portion of seal line (6A, 7A or 27, in Figures 2-4; see also col. 1: 39-54 which discloses peripheral seals) located on the other side of the separator being disposed such that said back-up and the portion of the seal line are overlapped with each other in a fuel cell stacking direction (e.g., Figure 12 shows a fuel cell stack comprising unit cells 2A wherein a seal line formed by gas seal members 6A and 7A on a {left} side of separator 5A and a backup (support member 29B) on the other {right} side of the separator. In a stacking direction, the gas seal members of the seal line and the backup are overlapped).



Art Unit: 1795

In response to applicant's argument, on page 8, lines 18-23, that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In response, Kikuchi et al. disclose a sealing structure in a fuel cell comprising separators made of carbon, but are silent as to a separator made of metal.

Inoue et al. teach a sealing structure in a fuel cell comprising separators made of carbon or a metal (paragraphs [0008] and [0017]), and disclose that with a carbon separator are readily broken by bending whereas metal separators have flexibility, so that even if a difference in the stresses in the sealing portion occurs, the difference is partially absorbed by the separator.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the carbon separator of Kikuchi et al. with the metal separator of Inoue et al. because both are concerned with a sealing structure in a fuel cell comprising separators, and Inoue et al. teach a metal separator having flexibility that would have provided good sealing characteristic by dispersing stress in the seals and providing a uniform surface pressure thereby eliminating gas leakage improving the performance of the fuel cell.

***Examiner Correspondence***

Art Unit: 1795

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS H. PARSONS whose telephone number is (571)272-1290. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795

Thomas H Parsons  
Examiner  
Art Unit 1795

\*\*\*